

What is claimed is:

1. A system for controlling and monitoring an electrical system, comprising:
a switchgear housing unit connected to the electrical system that includes a
switchgear mechanism for controlling a connection within the electrical system; and
5 electronic controls for monitoring and controlling the switchgear mechanism,
wherein the electronic controls are embedded within the switchgear housing unit to
form a single, self-contained unit.

2. The system of claim 1 wherein the electronic controls include an analog-to-
10 digital conversion component that digitizes voltage and current waveforms within the
switchgear housing unit.

3. The system of claim 2 wherein the electronic controls include a digital
interface that receives input from the analog-to-digital conversion component to enable an
15 operator to interface with the electronic controls.

4. The system of claim 2 further comprising:
a separate enclosure; and
a digital interface that is housed in the separate enclosure and that is connected to the
20 electronic controls embedded within the switchgear housing unit using a multi-conductor
cable that provides electronic control signals to enable an operator to interface with the
electronic controls.

5. The system of claim 1 wherein the electronic controls include an energy
25 storage component embedded within the switchgear housing unit to provide backup power to
operate the electronic controls and the switchgear mechanism during a power interruption.

6. The system of claim 1 wherein the electronic controls include a programming
port to enable an operator to program the electronic controls.

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7. The system of claim 1 wherein the electronic controls include:
a current sensing device to measure current in the electrical system;

a voltage sensing device to measure voltage in the electrical system;
an analog-to-digital converter to digitize the measured current and voltage;
a processor device to process the digitized current and voltage measurements; and
a memory device to store the digitized current and voltage measurements.

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8. The system of claim 1 wherein the switchgear housing unit and the embedded electronic controls are physically located near a top of a utility pole.

9. The system of claim 1 wherein the switchgear housing unit includes a manual
10 operation device to operate the switchgear mechanism manually.

10. The system of claim 1 wherein the electronic controls include a communications module to enable remote management of the switchgear mechanism.

11. The system of claim 1 wherein the switchgear housing unit includes a
15 mechanism housing with one or more attached interrupter modules.

12. The system of claim 11 wherein the interrupter modules include one or more vacuum interrupters.

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13. The system of claim 1 wherein the switchgear mechanism is configured to provide fault isolation to the system.

14. The system of claim 1 wherein the switchgear mechanism is configured to
25 provide switching or tying operations between connections in the electrical system.

15. A method for controlling and monitoring an electrical system, the method comprising:

monitoring the electrical system using electronic controls embedded within a
30 switchgear housing unit; and

controlling the electrical system using the electronic controls embedded within the switchgear housing unit.

16. The method as in claim 15 further comprising:
measuring current and voltage of the electrical system; and
converting the current and voltage measurements to digital current and voltage
5 measurements.

17. The method as in claim 15 further comprising providing backup power to the
electronic controls using an energy storage module contained within the switchgear housing
unit.

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18. The method as in claim 15 further comprising remotely operating the
electronic controls using a communications module contained within the switchgear housing
unit.

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19. The method as in claim 15 further comprising manually operating a
switchgear mechanism using a manual operation device contained within the switchgear
housing unit.